

- HEINRICH, C. 1923. Revision of the North American moths of the subfamily Eucosminae of the family Olethreutidae. Bull. U. S. Nat. Mus., 123: pp. 32-71, 263-266, tt. 2, 13-18, 59.
- HÜBNER, J. 1825. Verzeichniss bekannter Schmettlinge [sic!]. Augsburg, p. 391.
- KENNEL, J. v. 1908-21. Die palaearktischen Tortriciden. Zoologica 21 (54), Stuttgart.
- OBRAZTSOV, N. 1946. Versuch einer systematischen Übersicht der europäischen Eucosmini-Gattungen. Zschr. Wein. Ent. Ges. 30 (1945): 20-46.
- PIERCE, F. N., and METCALFE, J. W. 1922. The genitalia of the group Tortricidae of Lepidoptera of the British Islands. Oundle, Northants.
- STEPHENS, J. F. 1852. List of the specimens of British animals in the collection of the British Museum. X, London, p. 63.
- WALSINGHAM, LORD. 1897. Proc. Zool. Soc. London, 1897, p. 125.

Swarming of *Blacus* sp. in California (Hymenoptera: Braconidae)

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Published observations on the swarming of *Blacus* males are comparatively few and all, so far, appear to be limited to the European literature. The following note is the first North American record of the swarming habit of *Blacus* males. The writer's brief observations began on the high foggy morning of June 5, 1948 when a dancing swarm of insects was noted in his backyard at Redwood City, San Mateo Co., California. A few swishes of the net resulted in the capture of 35 specimens, about half of the swarm. Specimens sent to Mr. C. F. W. Muesebeck¹

¹I am indebted to Mr. C. F. W. Muesebeck of the Bureau of Entomology and Plant Quarantine, Washington, D. C., for the original generic determination and references to literature. He explained that *Blacus* is unrevised in North America. Specimens were then forwarded to Mr. A. W. Stelfox of Dublin, Ireland, to whom I am also indebted, for their comparison with certain of the European species in his collection. He indicated the specimens were not representative of any European species he possessed but believed them to be "closely related to *ruficornis* Nees and *tripudians* Hal.," species which have been reported swarming. This *Blacus* is, therefore, probably not introduced, but native to California.

were kindly identified as males of an undescribed species of *Blacus*. This was the only time that these small blackish wasps were observed swarming in 1948. In 1949, at the same location, the swarming *Blacus* males were noted on many early evenings between the dates of April 28th and June 26th. Those swarmings were noted most frequently above or to the sides of a between the dates of April 28th and June 26th. These swarms probably did not contain more than a hundred individuals, and they occupied the space of a sphere approximately two feet in diameter, which would move rapidly up and down. On windy evenings, the swarm when caught in a gust of wind would momentarily be blown a foot or two to one side after which it would reform quickly into its original position. At no time were any large females noted flying about or entering into the swarms, as has been noted by Benson (1944).

In the British literature, the swarming of *Blacus* was first noted by Haliday (1836) with his original description of *Blacus tripudians*. Since this first observation, the following English and Irish records have been seen by the writer. Marshall (1889) reported *B. ruficornis* Nees swarming, Donisthorpe (1936) reported *B. paganus* Hal. swarming, and Stelfox (1941) and Benson (1944) reported *B. tripudians* Hal. swarming.

BIBLIOGRAPHY

- BENSON, R. B. 1944. Swarming flight of *Blacus tripudians* Haliday (Hym., Braconidae). Ent. Mon. Mag., **80** (956): 21.
- DONISTHORPE, H. 1936. Dancing habits of some Braconidae. Ent. Rec. Jour. Variation, **48** (7-8): 84.
- HALIDAY, A. H. 1836. Essay on Parasitic Hymenoptera (cont'd). Ent. Mag., **3** (1): 20-45.
- MARSHALL, J. A. 1889. A monograph of British Braconidae, Part III. Trans. Ent. Soc. London, (4) **22**: 149-211.
- STELFOX, A. W. 1941. A new species of *Blacus* (Hymenoptera: Braconidae) with some notes on other species of the genus. Proc. Royal Irish Acad., **46** (sect. B) (9): 121-124.